

Borehole

50-09-05**Log Event A****Borehole Information**

Farm : <u>T</u>	Tank : <u>T-109</u>	Site Number : <u>299-W10-134</u>
N-Coord : <u>43,397</u>	W-Coord : <u>75,812</u>	TOC Elevation : <u>671.68</u>
Water Level, ft : <u>89.7</u>	Date Drilled : <u>3/31/1974</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness, in. : <u>0.250</u>	ID, in. : <u>4</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>94</u>	
Type : <u>Steel-welded</u>	Thickness, in. : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>94</u>	

Cement Bottom, ft. : 94 Cement Top, ft. : 0

Borehole Notes:

Borehole 50-09-05 was originally drilled in March 1974 to a depth of 94 ft with 6-in. casing. The first location for this borehole was abandoned after a hard object was encountered at about 39 ft. According to the driller's log, the driller thought that this object was an old line of some kind, and efforts to drill through the object failed. The casing was removed from the borehole and the drill was moved 5 ft due east of the original location. At the second borehole location, a hard object was encountered at 40 ft. The driller's log indicates that concrete was encountered and drilled through from 40 to 42 ft.

The borehole was completed to a depth of 94 ft with 6-in. casing. The 6-in. casing was perforated from the ground surface to 20 ft and 92 to 94 ft with two cuts per foot. A 4-in. casing was installed inside the 6-in. casing and the annular space between the two casings was grouted with 109 gal of cement.

The tops of both casings, which are the zero reference for the SGLS, are approximately even with the ground surface.

Equipment Information

Logging System : <u>2B</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>10/1997</u>	Calibration Reference : <u>GJO-HAN-14</u>	Logging Procedure : <u>MAC-VZCP 1.7.10-1</u>

Logging Information

Log Run Number : <u>1</u>	Log Run Date : <u>12/17/1997</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>200</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>48.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

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Log Run Number :	<u>2</u>	Log Run Date :	<u>12/18/1997</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>90.0</u>	Counting Time, sec.:	<u>200</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>47.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Logging Operation Notes:

Borehole 50-09-05 was logged in two runs. The total logging depth achieved by the SGLS was 90 ft. Spectra were collected at intervals of 0.5 ft using a 200-s counting time.

At the time of logging, there was water in the borehole at a depth of 89.7 ft.

Analysis Information

Analyst : D.L. ParkerData Processing Reference : MAC-VZCP 1.7.9Analysis Date : 05/21/1998**Analysis Notes :**

The pre-survey and post-survey field verification for each logging run met the acceptance criteria established for peak shape and system efficiency. The energy calibration and peak-shape calibration from the field verification spectrum that most closely matched the field data were used to establish the peak resolution and channel-to-energy parameters used in processing the spectra.

A casing correction factor for 0.50-in.-thick steel casing was used to determine concentration data over the entire depth. This factor most closely matches the combined thickness of the 4-in. and 6-in. casings. Concentrations are lower than actual because there is no allowance for the effects of the annular grout between casings. A grout correction was not made because none is available.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

A time-sequence plot of selected historical gross gamma log data from 1979 to 1982 is presented with the SGLS log plots.

Results/Interpretations:

The man-made radionuclides Cs-137 and Co-60 were detected by the SGLS. The Cs-137 contamination was



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detected only at the ground surface.

Co-60 contamination was detected almost continuously from 69 to 85.5 ft. Apparent Co-60 concentrations ranged from 0.07 to 0.2 pCi/g. The maximum apparent Co-60 concentration of 0.2 pCi/g was recorded at 80 ft.

Apparent K-40 concentrations are relatively constant at about 9 to 10 pCi/g from 1 to 38 ft and then increase slightly to about 11 to 12 pCi/g below 38 ft.